

MATERIALS HANDLING TASKS

A poorly designed materials handling task is one where the strength requirements to complete the task exceed the strength capabilities of most workers. Simply put, most workers would not be able to perform the task without overexertion. A task is potentially hazardous if it includes one or, more significantly, a number of the following activities:

- Lifting or lowering an item with one hand and/or rough, jerking motions rather than with a two-handed, smooth motion.
- Lifting, lowering, or carrying bulky objects that cannot be held close to the body.
- Handling or lifting materials more than three or four times per minute during an 8-hour work shift.
- Lifting or lowering between the floor and mid-thigh.
- Lifting or lowering above shoulder height.
- Lifting or lowering objects in cramped work areas that may result in twisting the torso (e.g., lifting and twisting in one motion).
- Exerting forces in awkward positions-to the side, overhead, or at extended reaches.
- Handling difficult-to-grasp items (e.g., with no handles).
- Handling items that place high pressure on the hands from thin edges, such as pail handles or sheet-metal edges.
- Pushing or pulling items, such as carts or boxes, that require large breakaway forces to get started.
- Lifting and carrying items on walkways that are obstructed, poorly illuminated, slippery, too narrow, or congested with vehicle and/or pedestrian traffic.

The following tables provide suggestions on how to properly lift and lower, push and pull, and carry various objects.

Proper Design of Pushing and Pulling Tasks

To do this:	Follow these suggestions:
Increase material flow through the workplace	<ul style="list-style-type: none">▪ Establish adequate receiving, storage, and shipping facilities.▪ Maintain adequate aisle and access areas.

Eliminate the need to lift or lower manually	<p>Use--</p> <ul style="list-style-type: none"> ▪ Lift tables and platforms. ▪ Lift trucks. ▪ Cranes and hoists. ▪ Drum and barrel dumpers. ▪ Elevating conveyors. ▪ Elevated pallets ▪ Gravity dump and/or chute systems. ▪ Vacuum systems. ▪ Automatic feed systems
Increase weight to a point where it must be mechanically handled	<ul style="list-style-type: none"> ▪ Use pallets to handle raw materials and products in bulk quantities ▪ Use the unit load concept (e.g., bulk handling of large bins or containers).
Reduce the weight of the object(s) or the force required to lift or lower the object(s)	<ul style="list-style-type: none"> ▪ Reduce the weight and capacity of the container(s). ▪ Improve the handhold or grip on the object. ▪ Reduce the load in the container. ▪ Specify the quantity per container to suppliers. <p>Assign the job to two or more persons</p>
Reduce the hand distance from the body	<ul style="list-style-type: none"> ▪ Change the shape of the object or container ▪ Provide grips or handles <p>Provide better access to objects</p>
Convert lift/carry or lower/carry combinations to a push or pull task	<p>Use--</p> <ul style="list-style-type: none"> ▪ Conveyors.

	<ul style="list-style-type: none"> ▪ Hand trucks. ▪ Ball-caster tables ▪ Four-wheel carts.
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Proper Design of Pushing and Pulling Tasks

To do this:	Follow these suggestions:
Eliminate the need to push or pull	<p>Use--</p> <ul style="list-style-type: none"> ▪ Conveyors (powered and non-powered). ▪ Powered trucks. ▪ Lift tables. ▪ Slides or chutes.
Reduce the force required to push or pull	<ul style="list-style-type: none"> ▪ Improve the handhold or grip on the handle ▪ Reduce the size and/or weight of the load. ▪ Use four-wheel trucks or dollies. ▪ Use nonpowered conveyors. ▪ Require that wheels or casters on hand trucks and dollies have periodic lubrication of bearings, adequate maintenance, and proper sizing (e.g., provide larger diameter wheels and casters). ▪ Maintain floors to eliminate holes and bumps. ▪ Improve the sole of the shoe to increase the shoe's grip on the floor surface.
Reduce the distance of the push or pull	<ul style="list-style-type: none"> ▪ Relocate receiving, storage, production, or shipping areas. <p>Improve production process to eliminate unnecessary material handling steps.</p>
Optimize the technique of the push or pull	<ul style="list-style-type: none"> ▪ Eliminate one-handed pushing or pulling tasks. ▪ Provide variable-height handles so that both short and tall persons can maintain an elbow bend of 80 to 100 degrees. ▪ Make sure wrists are not fully pronated (bent forward)

	<p>when pulling</p> <ul style="list-style-type: none"> ▪ Replace a pull with a push whenever possible. ▪ Use ramps with a slope of less than 10 percent ▪ Keep exertion within shoulder to mid-thigh (standing) vertical range.
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Proper Design of Carrying Tasks

To do this:	Follow these suggestions:
Eliminate the need to carry heavy objects.	<ul style="list-style-type: none"> ▪ Rearrange the workplace to eliminate unnecessary movement of material. ▪ Use mechanical handling aids, such as-- <ul style="list-style-type: none"> ○ Conveyors. ○ Lift trucks. ○ Hand trucks. ○ Tables or slides between workstations. ○ Four-wheel carts or dollies. ○ Air or gravity press ejection systems. ○ Overhead cranes.
Reduce the weight carried	<ul style="list-style-type: none"> ▪ Reduce the weight of the object. ▪ Reduce the weight of the container ▪ Reduce the load in the container. ▪ Specify quantity per container to suppliers ▪ Eliminate one-handed carries. ▪ Improve the handhold or grip on the container.
Reduce the bulk of materials carried	<ul style="list-style-type: none"> ▪ Reduce the size or shape of the object or container. ▪ Provide handles or hand grips that allow materials to be held close to the body. ▪ Assign the job to two or more persons.

Reduce the carry distance	<ul style="list-style-type: none">▪ Relocate receiving, storage, production, or shipping areas.▪ Use powered and nonpowered conveyors.
Convert the carry to a push or pull task	<ul style="list-style-type: none">▪ Use nonpowered conveyors.▪ Use hand trucks and pushcarts.